**Lesson Plan Title: Exponential growth exploration**

**Concept / Topic To Teach: Exponential Growth**

**Grade level: 9-12**

**Inquiry Method: Hands-on Activity**

**Florida State Standards Addressed: MA.912.A.8.1 Define exponential and logarithmic functions and determine their relationship. MA.912.S.3.2 Collect, organize, and analyze data sets. MA.912.S.3.3 Calculate and interpret the measure of the center of a data set.**

**General Goal(s): Students will explore and draw conclusions about exponential growth and decay through a hands-on activity.**

**Specific Objectives: Students will complete the bouncing ball activity will graph and create exponential decay functions**

**Required Materials: Board, Bouncing ball worksheet, meter sticks, golf balls**

**Anticipatory Set (Lead-In): Introduce and explain the activity.**

**Step-By-Step Procedures:**

**Intro: Break students into groups of 3 to 4. Have one student come and get a meter stick and golf ball for their groups. Take students outside to bounce the balls in the courtyard.**

**Follow the procedure of the Bouncing Ball activity as directed on activity sheet, go around and help groups that are having difficulty.**

**Once students have finished, reconvene the class and investigate the graph they discovered. Facilitate questioning to help students draw the conclusion that the graph is not linear or quadratic. Introduce the basic form of an exponential equation. Students can use inquiry and trial and error to decide what values can be plugged in for a and b.**

**Plan For Independent Practice: Student groups must record the data and graph it.**

**Closure (Reflect Anticipatory Set): Discuss their findings. Reinforce what an exponential equation is and how it differs from a linear or quadratic equation.**

**Pre-Requisite skills: Graphing data, calculating ratios and mean.**

**Assessment Based On Objectives: Data Analysis section of worksheet.**

**Adaptations (For Students With Learning Disabilities): Group work.**

**Extensions (For Gifted Students): Challenge students while circling the room. Ask what relationship one bounce has with the next.**

**Possible Connections To Other Subjects: Biology**

**Common Student Errors: Students may graph the variables on the wrong axes, so be sure students put the bounce number on the x axis. It is important students are careful in taking data. Inaccurate data will make understanding the concept almost impossible, make sure students take careful measurements.**

**References:**